

SEQUENCE LISTING

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<120> POLYPEPTIDES OF STREPTOCOCCUS PYOGENES

<130> 484112.436USPC

<140> 10/568,737

<141> 2004-08-16

<150> PCT/CA2004/001510

<151> 2004-08-16

<150> US 60/495,094

<151> 2003-08-15

<160> 46

<170> PatentIn version 3.3

<210> 1

<211> 537

<212> DNA

<213> Streptococcus pyogenes

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attacttca ctgttgctaa cccaacttca atctcagttg aaggaatcaa caaagaagtt 420
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<210> 2

<211> 178

<212> PRT

<213> Streptococcus pyogenes

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35	40	45
Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile		
50	55	60
His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser		
65	70	75
Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala		
85	90	95
Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln		
100	105	110
Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro		
115	120	125
Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr		
130	135	140
Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys		
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Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr		
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Gly Lys		

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atcagcttga ctttagctgg cgaagtaaca gctacaaca gcagcaaagt caaaatcgac	240
tcaagtaaaag gagaagtcaa agaggtctt gttaaaaaaag gcgatgttg caaagttagga	300
caacccttgt ttagctatga aacgtcacag cggtaacgg ctcaaagtgc agaatttgat	360
gttcaaacca aagccaatca gctccaagtt gctaaaaacca atgcagcatt gaagtggaa	420
acctacaatc gcaaggtaa tggaaatcaac accctaaaat ctcgctacaa cactgcacca	480
gatgagagct tactagagca aattcgacgc gcagaagaca gtgtatccca agcactaagc	540
gatgccaaaa cagcagatag cgatgtcaaa accgctcaaa tcgaactcga taaagctaatt	600
gctactgcca caacggaaaa agttaaacta gagtatgaca cctttaagtgc agacaccgca	660
ggaaccattt ttagtctaaa tactgatttg ccaaataat caaaatccaa aaaagaaaaat	720
gaaaactttt tggaaattat cgacaaatca aaaatgttag tcaaaggtaa cattagtggaa	780
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caaggtaag gccaagggtgg caatgacccaa caagataatc caaaccaagc aaaattccct	960
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aatgtgctca acaatgttcc agaagctggc aagatcgat tggataaaa acaaggtaaa aaaacaagaa	1080
gcagaaaaatg gaaaaaccta tggatggaaa gttgataaaa acaaggtaaa aaaacaagaa	1140
atcaagacta agcccttctc aaaaggttat gttgaggtaa caagtggctt gactatgcaat	1200
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<212> PRT

<213> Streptococcus pyogenes

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 35 40 45
 Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr
 50 55 60
 Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp
 65 70 75 80
 Ser Ser Lys Gly Glu Val Lys Glu Val Phe Val Lys Lys Gly Asp Val
 85 90 95
 Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu
 100 105 110
 Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu
 115 120 125
 Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg
 130 135 140
 Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro
 145 150 155 160
 Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser
 165 170 175
 Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala
 180 185 190
 Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Glu Lys Gly
 195 200 205
 Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val
 210 215 220
 Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn
 225 230 235 240
 Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly
 245 250 255
 Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Gly Gln Lys Val
 260 265 270
 Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val
 275 280 285
 Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly
 290 295 300
 Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro
 305 310 315 320
 Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser
 325 330 335
 His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile
 340 345 350
 Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val
 355 360 365
 Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys
 370 375 380
 Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln
 385 390 395 400

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 405 410 415
 Gly Ser Ile Val Lys Pro
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 <212> DNA
 <213> Streptococcus pyogenes

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 gttgtgtgg ttgatatctg tgaccgttta aatttagacc tcgttgggt ttgtatagt
 aaattatata cccttcctaa acgctatgtat gctgttaagc gtgtgggtt acccatgaat
 cctgatatacg agttgattgc ttctttgaaa ccaacttggaa ttttgagttcc caattctta
 caagaagatt tggaaaccaa gtatcaaaaa ttggatactg agtatggtt tttgaactta
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 cgttaaggaa agaaaaagcc taaagtgtttt attcttatgg gcttgccagg tagttatgg
 gtggcgacga accaatcttta ttagggaaat cttttttttt tgccaggtgg tgagaatgtt
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<210> 6
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 <213> Streptococcus pyogenes

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 35 40 45
 Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr
 50 55 60
 Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn
 65 70 75 80
 Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser
 85 90 95
 Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp
 100 105 110
 Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln
 115 120 125
 Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys
 130 135 140
 Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys
 145 150 155 160

Arg Lys Gly Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro
 165 170 175
 Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu
 180 185 190
 Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe
 195 200 205
 Leu Ser Ala Asn Pro Glu Asp Met Leu Ala Lys Glu Pro Asp Leu Ile
 210 215 220
 Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys Val Met Phe Asp
 225 230 235 240
 Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys
 245 250 255
 Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala
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 <213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

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 <213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

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<212> DNA
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<223> Oligonucleotide primer

<400> 12
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<210> 13
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<212> DNA
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<223> Oligonucleotide primer

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<210> 14
<211> 29
<212> DNA
<213> Artificial Sequence

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<223> Oligonucleotide primer

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<212> DNA
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<223> Oligonucleotide primer

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<210> 16
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<210> 17
<211> 33
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<212> DNA
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<400> 20
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<210> 21
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<212> DNA
<213> Streptococcus pyogenes

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gttggtcaaa cagctgctta catccgtagc ttgcgttac cagagcctta caaaggcaaa 480
gggatccgtt acgttggta atacgtacgc cttaaagaag gtaaaacagg taaataaa 537

<210> 22
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<212> PRT
<213> Streptococcus pyogenes

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20 25 30
Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr
35 40 45

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Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile
 50 55 60
 His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser
 65 70 75 80
 Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala
 85 90 95
 Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln
 100 105 110
 Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro
 115 120 125
 Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr
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 145 150 155 160
 Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr
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 Gly Lys

<210> 23
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 <212> DNA
 <213> *Streptococcus pyogenes*

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 gttggtaaaa cagctgctta catccgttagc ttgcgttac cagagcctta caaaggcaaa 480
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 <213> *Streptococcus pyogenes*

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 20 25 30
 Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr
 35 40 45
 Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile
 50 55 60
 His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser
 65 70 75 80
 Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala
 85 90 95
 Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln

100	105	110
Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro		
115	120	125
Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr		
130	135	140
Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys		
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Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr		160
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<211> 537

<212> DNA

<213> Streptococcus pyogenes

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gttggtcaaa cagctgctta catccgtacg ttgcgttac cagagcctta caaaggcaaa	480
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<210> 26

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<212> PRT

<213> Streptococcus pyogenes

<400> 26

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		15
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Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr		
35	40	45
Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile		
50	55	60
His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser		
65	70	75
		80
Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala		
85	90	95
Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln		
100	105	110
Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro		
115	120	125
Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr		
130	135	140
Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys		
145	150	155
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Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr
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 Gly Lys

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<210> 28
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 <213> Streptococcus pyogenes

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 20 25 30
 Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr
 35 40 45
 Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile
 50 55 60
 His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser
 65 70 75 80
 Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala
 85 90 95
 Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln
 100 105 110
 Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro
 115 120 125
 Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr
 130 135 140
 Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys
 145 150 155 160
 Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr
 165 170 175
 Gly Lys

<210> 29
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 <212> DNA

<213> Streptococcus pyogenes

<400> 29

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acctacaatc	gcaaggtcaa	tgaaatcaac	accctaaaat	ctcgctacaa	cactgcacca	480
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tatgttattt	aacttgacca	atcagacaaag	cagccactca	ttggctcaca	cacccatgtt	1020
aatgtactca	acaatgttcc	agaagctggc	aagatcgtat	tgaaagaaac	ctttacaatg	1080
gcagaaaaatg	gaaaaaccta	tgtgtggaaa	gttgataaaa	acaaggtaa	aaaacaagaa	1140
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<211> 422

<212> PRT

<213> Streptococcus pyogenes

<400> 30

Met	Phe	Gln	Leu	Arg	Lys	Lys	Met	Thr	Arg	Lys	Gln	Leu	Ala	Leu	Leu
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Ser	Ala	Gly	Val	Leu	Thr	Cys	Val	Val	Gly	Gly	Ser	Tyr	Leu	Ile	Met
							20		25				30		
Asn	His	Gln	Gln	Gln	Glu	Ile	Val	Ser	Ser	Val	Asn	Lys	Val	Lys	Ala
							35		40			45			
Leu	Thr	Ile	Lys	Glu	Ala	Met	Glu	Gln	Gly	Lys	Asp	Ile	Ser	Leu	Thr
							50		55			60			
Leu	Ala	Gly	Glu	Val	Thr	Ala	Asn	Asn	Ser	Ser	Lys	Val	Lys	Ile	Asp
							65		70			75		80	
Ser	Ser	Lys	Gly	Glu	Val	Lys	Glu	Val	Phe	Val	Lys	Lys	Gly	Asp	Val
							85		90			95			
Val	Lys	Val	Gly	Gln	Pro	Leu	Phe	Ser	Tyr	Glu	Thr	Ser	Gln	Arg	Leu
							100		105			110			
Thr	Ala	Gln	Ser	Ser	Glu	Phe	Asp	Val	Gln	Thr	Lys	Ala	Asn	Gln	Leu
							115		120			125			
Gln	Val	Ala	Lys	Thr	Asn	Ala	Ala	Leu	Lys	Trp	Glu	Thr	Tyr	Asn	Arg
							130		135			140			
Lys	Val	Asn	Glu	Ile	Asn	Thr	Leu	Lys	Ser	Arg	Tyr	Asn	Thr	Ala	Pro
							145		150			155		160	
Asp	Glu	Ser	Leu	Leu	Glu	Gln	Ile	Arg	Ser	Ala	Glu	Asp	Ser	Val	Ser

165	170	175
Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala		
180	185	190
Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Thr Glu Lys Gly		
195	200	205
Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val		
210	215	220
Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn		
225	230	235
Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly		
245	250	255
Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Gly Gln Lys Val		
260	265	270
Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val		
275	280	285
Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly		
290	295	300
Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro		
305	310	315
Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser		
325	330	335
His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile		
340	345	350
Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val		
355	360	365
Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys		
370	375	380
Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln		
385	390	395
Asp Lys Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val		
405	410	415
Gly Ser Ile Val Lys Pro		
420		

<210> 31
 <211> 1269
 <212> DNA
 <213> Streptococcus pyogenes

<400> 31

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atcagcttga ccttagctgg cgaagtaaca gctaacaaca gcagcaaagt caaaatcgac	240
tcaagtaaag gagaagtcaa agaggtctt gttaaaaaag gcgatgtgt caaagttagga	300
caacccttgc tttagctatga aacgtcacag cggtaaacgg ctcaaagtgc agaatttgat	360
gttcaaacc aagccaatca gtcacagg tttagctatga aacgtcacag cggtaaacgg ctcaaagtgc agaatttgat	420
acccataatc gcaagggtcaa tggaaatcaac accctaaaat ctcgctacaa cactgcacca	480
gatgagagct tactagagca aattcgacgc gcagaagaca gtgtatccca agcactaagc	540
gatgccaaaa cagcagatag cgtatgtcaa accgatcaaa tcgaaactcga taaagctaat	600
gctactgcca caacggaaaa aggtaaacta gagtatgaca ccgttaagtgc agacaccgca	660
ggaaccattg tttagtctaaa tactgatttg ccaaataatcaat caaaatccaa aaaagaaaaat	720
gaaactttta tggaaattat cgacaaatca aaaaatgttag tcaaaggtaa cattagtgaa	780

tttgaccgtg acaagttaaa aatcggtcaa aaagtcgaag tgattgaccg caaagacaac	840
tctaaaaat ggactggaaa agtaacccaa gttggcaacc tcaaagcaga ggaaaaaggc	900
caaggtcaag gccaagggtgg caatgaccaa caagataatc caaaccgaagc aaaattccct	960
tatgttattg aacttgacca atcagacaag cagccactca ttggctcaca cacctatgtt	1020
aatgtactca acaatgttcc agaagctggc aagatcgat tgaaagaaac ctttacaatg	1080
gcagaaaaatg gaaaaaccta tttgtggaaa gttgataaaa acaaggtcaa aaaacaagaa	1140
atcaagacta agcccttctc aaaaggttat gttgaggtaa caagtggctt gactatgcaa	1200
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aaaccttaa	1269

<210> 32
<211> 422
<212> PRT
<213> Streptococcus pyogenes

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Asn His Gln Gln Gln Glu Ile Val Ser Ser Val Asn Lys Val Lys Ala	
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Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr	
50 55 60	
Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp	
65 70 75 80	
Ser Ser Lys Gly Glu Val Lys Glu Val Phe Val Lys Lys Gly Asp Val	
85 90 95	
Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu	
100 105 110	
Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu	
115 120 125	
Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg	
130 135 140	
Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro	
145 150 155 160	
Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser	
165 170 175	
Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala	
180 185 190	
Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Glu Lys Gly	
195 200 205	
Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val	
210 215 220	
Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn	
225 230 235 240	
Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly	
245 250 255	
Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Gly Gln Lys Val	
260 265 270	
Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val	
275 280 285	
Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly	

290	295	300			
Gln	Gly	Gly Asn Asp Gln	Gln	Asp Asn Pro Asn	Gln Ala Lys Phe Pro
305		310		315	320
Tyr	Val	Ile Glu Leu Asp Gln Ser Asp	Lys Gln	Pro Leu Ile Gly Ser	
		325		330	335
His	Thr	Tyr Val Asn Val Leu Asn Asn Val Pro	Glu Ala Gly Lys Ile		
		340		345	350
Val	Leu	Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val			
		355		360	365
Trp	Lys	Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys			
		370		375	380
Pro	Phe	Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln			
385		390		395	400
Asp	Lys	Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val			
		405		410	415
Gly	Ser	Ile Val Lys Pro			
		420			

<210> 33
 <211> 1269
 <212> DNA
 <213> Streptococcus pyogenes

<400> 33

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tctagtgtca acaaagtaaa agcctaacc ataaaagaag ccatggaaca aggaaaagat	180
atcagcttga ccttagctgg cgaagtaaca gctaacaaca gcagcaaagt caaaatcgac	240
tcaagtaaag gagaagtcaa agaggcttt gtcaaaaaag gcgatgttgc caaagttagga	300
caacccttgt ttagctatga aacgtcacag cggtaacgg ctcaaagttc agaatttgat	360
gttcaaacca aagccatca actccaagt gctaaaacca atgcagcatt gaagtggaa	420
acctacaatc gcaaggctaa tggaaatcaac accctaaaat ctcgtacaa cactgcacca	480
gatgagagct tactagagca aattcgcacgc gcagaagaca gtgtatccca agcactaagc	540
gatgccaaaa cagcagatag cgatgtcaaa accgctcaaa tgcactcga taaagcta	600
gctactgcca caatggaaaa agttaaacta gagtatgaca cgcgttgc agacaccgca	660
ggaaccattt ttagcctaaa tactgatttg ccaaatcaat caaaatccaa aaaagaaaaat	720
gaaactttt tggaaattat cgacaaatca aaaatgttag tcaaaggtaa catcagtgaa	780
tttgaccgtg acaagttaaa aatcgtcaaa aaagtcaag tgattgaccc caaagacaac	840
tctaaaaat ggactggaaa agtaacccaa gttggcaacc tcaaaggcaga gggaaaaggc	900
caagggtcaag gccaagggtgg caatgaccaaa caagacaatc caaaccaagc aaaattccct	960
tatgttatcg aacttgacca atcagacaaag cagccactca ttggctcaca cacctatgtt	1020
aatgtgctca acaatgtcc agaagctggc aagatcgtat tggaaagaaac cttaatcg	1080
gcagaaaaatg gaaaaaccta tgggtggaaa gttgataaaa acaaggtaaa aaaacaagaa	1140
atcaagacta agcccttc aaaaaggat tggaggtga caagttggctt gactatgca	1200
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aaaccttaa	1269

<210> 34
 <211> 422
 <212> PRT
 <213> Streptococcus pyogenes

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 35 40 45
 Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr
 50 55 60
 Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp
 65 70 75 80
 Ser Ser Lys Gly Glu Val Lys Glu Val Phe Val Lys Lys Gly Asp Val
 85 90 95
 Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu
 100 105 110
 Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu
 115 120 125
 Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg
 130 135 140
 Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro
 145 150 155 160
 Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser
 165 170 175
 Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala
 180 185 190
 Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Met Glu Lys Gly
 195 200 205
 Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val
 210 215 220
 Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn
 225 230 235 240
 Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly
 245 250 255
 Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Asp Gln Lys Val
 260 265 270
 Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val
 275 280 285
 Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly
 290 295 300
 Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro
 305 310 315 320
 Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser
 325 330 335
 His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile
 340 345 350
 Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val
 355 360 365
 Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys
 370 375 380
 Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln
 385 390 395 400
 Asp Lys Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val
 405 410 415
 Gly Ser Ile Val Lys Pro

420

<210> 35
 <211> 1269
 <212> DNA
 <213> *Streptococcus pyogenes*

<400> 35

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tctagtgtca	acaaagtaaa	agccttaacc	ataaaaagaag	ccatggaaaca	aggaaaagat	180
atcagcttga	ccttagctgg	cgaagtaaca	gctacaacaaca	gcagcaaagt	caaaatcgac	240
tcaagtaaag	gagaagtc当地	agatgtctt	gtcaaaaaag	gcgatgttg	caaagttagga	300
caacccttgc	ttagctatga	aacgtcacaa	cggtaacgg	ctcaaagtgc	agaatttgat	360
gttcaaacc	aagccaatca	actccaaagt	gctaaacca	atgcagcatt	gaagtggaa	420
acctacaatc	gcaaggtaaa	tgaaatcaat	accctaaaat	ctcgctacaa	cactgcacca	480
gatgagagct	tactagagca	aattcgacgc	gcagaagaca	gtgtatctca	agcactaagc	540
gatgccaaa	cagcagatag	cgatgtcaaa	accgctcaaa	tgcgactcga	taaagctaat	600
gctactgccc	caacggaaaa	aggtaaacta	gagttatgaca	ccgtaagtc	agacaccgca	660
ggaaccattt	ttagtc当地	tactgattt	ccaaatcaat	caaaatccaa	aaaagaaaaat	720
gaaactttt	tggaaattat	cgacaaatca	aaaatgttag	tcaaaggtaa	catcagtgaa	780
tttgaccgtg	acaagttaaa	aatcgatcaa	aaagtgc当地	tgattgaccg	caaagacaac	840
tctaaaaat	ggactggaaa	agtaacccaa	gttggcaacc	tcaaaggcaga	ggaaaaaggc	900
caaggtcaag	gccaagggtgg	caatgaccaa	caagataatc	caaaccacgc	aaaattccct	960
tatgttatcg	aacttgacca	atcagacaag	cagccactca	ttggttcaca	cacctatgtt	1020
aatgtgctca	acaatgttcc	agaagctggc	aagatcgat	tgaaagaaac	ctttacaatg	1080
gcagaaaaatg	gaaaaaccta	tgtgtggaaa	gttgataaaa	acaaggtaaa	aaaacaagaa	1140
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aaaccttaa						1269

<210> 36
 <211> 422
 <212> PRT
 <213> *Streptococcus pyogenes*

<400> 36

Met	Phe	Gln	Leu	Arg	Lys	Lys	Met	Thr	Arg	Lys	Gln	Leu	Ala	Leu	Leu
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							20		25						30
Asn	His	Gln	Gln	Gln	Glu	Ile	Val	Ser	Ser	Val	Asn	Lys	Val	Lys	Ala
						35		40							45
Leu	Thr	Ile	Lys	Glu	Ala	Met	Glu	Gln	Gly	Lys	Asp	Ile	Ser	Leu	Thr
						50		55							60
Leu	Ala	Gly	Glu	Val	Thr	Ala	Asn	Asn	Ser	Ser	Lys	Val	Lys	Ile	Asp
						65		70							80
Ser	Ser	Lys	Gly	Glu	Val	Lys	Asp	Val	Phe	Val	Lys	Lys	Gly	Asp	Val
						85		90							95
Val	Lys	Val	Gly	Gln	Pro	Leu	Phe	Ser	Tyr	Glu	Thr	Ser	Gln	Arg	Leu
						100		105							110
Thr	Ala	Gln	Ser	Ser	Glu	Phe	Asp	Val	Gln	Thr	Lys	Ala	Asn	Gln	Leu

115	120	125
Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg		
130	135	140
Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro		
145	150	155
Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser		
165	170	175
Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala		
180	185	190
Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Ala Thr Glu Lys Gly		
195	200	205
Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val		
210	215	220
Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn		
225	230	235
Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly		
245	250	255
Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Asp Gln Lys Val		
260	265	270
Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val		
275	280	285
Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly		
290	295	300
Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro		
305	310	315
Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser		
325	330	335
His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile		
340	345	350
Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val		
355	360	365
Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys		
370	375	380
Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln		
385	390	395
Asp Lys Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val		
405	410	415
Gly Ser Ile Val Lys Pro		
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 <212> DNA
 <213> Streptococcus pyogenes

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 gttgctgtgg ttgatatactg tgaccgttta aatttagacc tcgttgggtt ttgtgatagt 180
 aaattatata cccttcctaa acgctatgtat gctgttaagc gtgtgggtt acccatgaat 240
 cctgatatacg agttgattgc ttctttgaaa ccaacttggaa ttttgatgtcc caattcttta 300
 caagaagatt tggaaacccaa gatatcaaaaa ttggataactg agtatggttt tttgaactta 360
 cgaagtgttg agggcatgtt ccagtctatt gatgatgtttag ggaacctttt ccaacgtcaa 420

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caagaagcaa aagaattgcg ccagcaatac caggactatt atcgtgctt ccaagctaaa 480
cgcaagggga agaaaaagcc taaagtgcctt attcttatgg gcttgcagg tagttatttg 540
gtggcgcacga accaatctta tgttaggaat cttttggact tggcagggtgg tgagaatgtt 600
tatcagtcag atgagaaaaga atttctatca gttaatccctg aagacatgtc agctaaggag 660
cctgacttga ttttacgaac agctcacgccc attccagaca aggtaaaagt gatgtttgac 720
aaagaatttg ctgaaaatga tattttggaaa cattttacgg cagtcagga agggaaaagtc 780
tatgatttgg acaataccctt gtttgcatg agtgcataat tgaactaccc agaagccttgc 840
gacacccctttaa cacagcttt tgaccacgtg ggagatcatc cgtaa 885

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<210> 38

<211> 294

<212> PRT

<213> *Streptococcus pyogenes*

<400> 38

<210> 39
 <211> 885
 <212> DNA
 <213> *Streptococcus pyogenes*

<400> 39

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 gttgctgtgg ttgatatactg tgaccgttta aatttagacc tcgttgggtt ttgtgatagt 180

 aaattatata cccttcctaa acgctatgtat gctgttaagc gtgtgggtt acccatgaat 240

 cctgatatacg agttgattgc ttcttgaaa ccaacttgaa ttttgagttcc caattctta 300

 caagaagatt tggAACCAA gtatcaaaaa ttggatactg agtatgggtt ttgaactta 360

 cgaagtgtt agggcatgtt ccagtctatt gatgatttag ggaacctttt ccaacgtcaa 420

 caagaagcaa aagaattgcg ccagcaatac caggactatt atcgtgctt ccaagctaaa 480

 cgcaaggggaa agaaaaagcc taaagtgtt attcttatgg gcttgccagg tagtatttg 540

 gtggcgacga accaatctt ttagggaaat cttttggact tggcaggtgg tgagaatgtt 600

 ttcagtcg atgagaaaaga atttctatca gttatcctg aagacatgtt agctaaggag 660

 cctgacttga ttacgaaac agtcacgccc attccagaca agttaaaagt gatgttgac 720

 aaagaatttg ctgaaaatga tatttgaaa cattttacgg cagtcaagga agggaaagtc 780

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<210> 40
 <211> 294
 <212> PRT
 <213> *Streptococcus pyogenes*

<400> 40

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 Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp

 35 40 45

 Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr

 50 55 60

 Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn

 65 70 75 80

 Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser

 85 90 95

 Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp

 100 105 110

 Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln

 115 120 125

 Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys

 130 135 140

 Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys

 145 150 155 160

 Arg Lys Gly Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro

 165 170 175

 Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu

 180 185 190

 Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe

195	200	205
Leu Ser Val Asn Pro Glu Asp Met	Leu Ala Lys Glu Pro Asp	Leu Ile
210	215	220
Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys	Val Met Phe Asp	
225	230	235
Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys		240
245	250	255
Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala		
260	265	270
Lys Leu Asn Tyr Pro Glu Ala Leu Asp Thr Leu Thr Gln Leu Phe Asp		
275	280	285
His Val Gly Asp His Pro		
290		

<210> 41
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 <212> DNA
 <213> Streptococcus pyogenes

<400> 41

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gttgctgtgg ttgatatactg tgaccgttta aatttagacc tcgttgggtt ttgtatagt	180
aaattatata cccttcctaa acgctatgtat gctgttaagc gtgtgggtt acccatgaat	240
cctgatatacg agttgattgc ttctttgaaa ccaacttggaa ttttgagtcc caattctta	300
caagaagatt tggaaacccaa gtatcaaaaa ttggatactg agtatgggtt tttgaactta	360
cgaagtgttgc agggcatgtt ccagtcattt gatgattttt ggaacctttt ccaacgtcaa	420
caagaagccaa aagaatttgcg ccagcaatac caggactatt atcgtgtttt ccaagctaaa	480
cgttaaggggaa agaaaaagcc taaaagtgtt attcttatgg gcttgcagg tagtatttg	540
gtggcgacga accaatcttata ttagggaaat cttttggatt tggcagggtgg tgagaatgtt	600
tatcagtcag atgagaaaaga atttctatca gctaattcttgc aagacatgtt ggctaaggag	660
cctgatttga ttttacgaac agctcacgcc attccagaca aggtaaaagt gatgtttgac	720
aaagaatttg ctgaaaatga tattttggaaa cattttacgg cagtcaagga agggaaaagtc	780
tatgatttgg acaataccctt gtttggcatg agtgcataat tgaactaccc agaagccttg	840
gacaccttaa cacagctttt tgaccgcgtt ggagatcatc cgtaa	885

<210> 42
 <211> 294
 <212> PRT
 <213> Streptococcus pyogenes

<400> 42

Met Ile Lys Arg Cys Lys Gly Ile Gly Leu Ala Leu Met Ala Phe Phe			
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Leu Val Ala Cys Val Asn Gln His Pro Lys Thr Ala Lys Glu Thr Glu			
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Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp			
35	40	45	
Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr			
50	55	60	
Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn			
65	70	75	80
Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser			

85	90	95	
Pro Asn Ser Leu Gln Glu Asp Leu Glu	Pro Lys Tyr Gln Lys	Leu Asp	
100	105	110	
Thr Glu Tyr Gly Phe Leu Asn Leu Arg	Ser Val Glu Gly	Met Tyr Gln	
115	120	125	
Ser Ile Asp Asp Leu Gly Asn Leu Phe	Gln Arg Gln	Gln Glu Ala Lys	
130	135	140	
Glu Leu Arg Gln Gln Tyr Gln Asp Tyr	Tyr Arg Ala Phe	Gln Ala Lys	
145	150	155	160
Arg Lys Gly Lys Lys Pro Lys Val	Leu Ile Leu Met	Gly Leu Pro	
165	170	175	
Gly Ser Tyr Leu Val Ala Thr Asn Gln	Ser Tyr Val Gly	Asn Leu Leu	
180	185	190	
Asp Leu Ala Gly Gly Glu Asn Val	Tyr Gln Ser Asp	Glu Lys Glu Phe	
195	200	205	
Leu Ser Ala Asn Pro Glu Asp Met	Leu Ala Lys	Glu Pro Asp Leu Ile	
210	215	220	
Leu Arg Thr Ala His Ala Ile Pro Asp	Lys Val Lys Val	Met Phe Asp	
225	230	235	240
Lys Glu Phe Ala Glu Asn Asp Ile Trp	Lys His Phe	Thr Ala Val Lys	
245	250	255	
Glu Gly Lys Val Tyr Asp Leu Asp Asn	Thr Leu Phe	Gly Met Ser Ala	
260	265	270	
Lys Leu Asn Tyr Pro Glu Ala Leu Asp	Thr Leu Thr	Gln Leu Phe Asp	
275	280	285	
Arg Val Gly Asp His Pro			
290			

<210> 43
 <211> 885
 <212> DNA
 <213> Streptococcus pyogenes

<400> 43		
atgataaaac gatgtaaaagg aattggctca gtcttaatgg cttttttttt ggtagcttgt	60	
gtttaatcagg accctaaaaac ggctaaagag actgaacagc agagaattgt agccacttcg	120	
gttgctgtgg ttgatatactg tgaccgttta aatttagacc tcgttgggggt ttgtatagt	180	
aaatttatata cccttcctaa acgttatgtat gctgttaagc gtgtgggttt acccatgaat	240	
cctgatatacg agttgattgc ttcttgaaa ccaacttggaa tttttagtcc caattcttta	300	
caagaagatt tggaaacccaa gatcaaaaaa ttggatactg agtatgggtt tttgaactta	360	
cgaagtgttgg agggcatgtt ccagtctatt gatgatggtag ggaacctttt ccaacgtcaa	420	
caagaagccaa aagaatttgcg ccagcaatac caggactatt atcgtgcttt ccaagctaaa	480	
cgtaaaggaa agaaaaagcc taaaagtgcattt attcttatgg gcttgcagg tagttatgg	540	
gtggcgacga accaatcttta tggatggaaat cttttggact tggcagggtgg tgagaatgtt	600	
tatcagtcag atgagaaaaga atttcttatca gttaatcctg aagacatgtt agctaaggag	660	
cctgacttgc ttatcgaac agtcacgcc attccagaca aggtaaaagt gatgtttgac	720	
aaagaatttgc ctgaaaatga tatttgaaa cattttacgg cagtcaagga agggaaaagtc	780	
tatgatgg acaataccct gtttggcatg agtgctaaat tgaactaccc agaagccttg	840	
gacacccctaa cacagcttt tgaccacgtg ggagatcatc cgtaa	885	

<210> 44
 <211> 294
 <212> PRT

<213> Streptococcus pyogenes

<400> 44

Met Ile Lys Arg Cys Lys Gly Ile Gly Leu Val Leu Met Ala Phe Phe
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 Leu Val Ala Cys Val Asn Gln His Pro Lys Thr Ala Lys Glu Thr Glu
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 Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp
 35 40 45
 Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr
 50 55 60
 Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn
 65 70 75 80
 Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser
 85 90 95
 Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp
 100 105 110
 Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln
 115 120 125
 Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys
 130 135 140
 Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys
 145 150 155 160
 Arg Lys Gly Lys Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro
 165 170 175
 Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu
 180 185 190
 Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe
 195 200 205
 Leu Ser Val Asn Pro Glu Asp Met Leu Ala Lys Glu Pro Asp Leu Ile
 210 215 220
 Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys Val Met Phe Asp
 225 230 235 240
 Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys
 245 250 255
 Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala
 260 265 270
 Lys Leu Asn Tyr Pro Glu Ala Leu Asp Thr Leu Thr Gln Leu Phe Asp
 275 280 285
 His Val Gly Asp His Pro
 290

<210> 45

<211> 27

<212> PRT

<213> Streptococcus pyogenes

<400> 45

Met Phe Gln Leu Arg Lys Lys Met Thr Arg Lys Gln Leu Ala Leu Leu
 1 5 10 15
 Ser Ala Gly Val Leu Thr Cys Val Val Gly Gly
 20 25

<210> 46

<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 46
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24